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ORIGINAL ARTICLE

Frequency of Dry Eye Disease in Elderly Population and their Associated Risk Factors

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ABSTRACT

Objective: To know the pattern of dry eye disease (DED) in a tertiary care hospital and its association with various clinico-epidemiological factors.

Patients and Methods: This one-year cross sectional study was conducted at Federal Government Services Hospital from 1st January 2012 to 31st Dec 2012. About 1600 patients above 40 years of age were screened randomly for DED and included in the study. A 5-item standardized questionnaire (DEQ 5), Schirmer's test (ST), Tear film breakup time (TBUT), corneal fluorescein staining (CFS) for the presence of conjunctival injection, punctate epithelial erosions (PEE), and meibomian gland dysfunction (MGD) were used. The diagnosis was made on the presence of three out of five parameters. SPSS 17 was used to analysed the data.

Results: About 1600 willing patients were screened for DED. Among them four hundred and eighty-six (486) (30.37%) patients were diagnosed on the basis of symptoms and signs as DED. Out of them, 261(53.7%) were males and 225(46.25%) were females, 288(59.2%) were urban and 198(40.7%] belong to rural areas.

Conclusion: DED constitutes a major proportion of patients attending the ophthalmology department in a tertiary care hospital. It is a multifactorial disease, is frequent in an elderly male who are using drugs like an antihistamine, anti-BPH, antidepressant, and in postmenopausal women.

Key Words: Dry eye, Meibomian Gland Dysfunction, Schirmer test.

Author`s Contribution
[1] Conception, Synthesis, and Planning of the research,[2] Active participation in active methodology & discussion, [3]Data Analysis, [4]Helped in References and Literature search

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Introduction

The Swedish ophthalmologist Henrick Sjogren used the term "Kerato Conjunctivitis Sicca" comprising the triad of Kerato Conjunctivitis Sicca, dry mouth, and joint pains.[1] In 1946, Wolff described that the meibomian glands are essentially the proper glands of the cornea, which in the interests of vision have been moved out of the way.[2] In 1950 De Roth used the term "Dry Eye".[3] In 1955 it was named as a problem due to decreased tear production.[4] In 2006 Delphi panel proposed Dysfunctional Tear Syndrome (DTS) with the remarks that inflammation plays a role in the disease.[5] In 2007, the international Dry Eye workshop (Dews) developed a new definition as "Dry Eye is a multifactorial disease of tear and ocular surface that results in symptoms of discomfort, visual disturbance and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the

tear film and inflammation of ocular surface.[6] About 4.7% of American men and 7.8% of American women aged 50 years and older had DED[7], about 3.2 million women and about one million men are involved in United States.[8]

Only a few population-based studies are available. Salisbury Eye Study in US shows the prevalence of DED to be 14.6%.[9] One study carried out in a tertiary care hospital in Pakistan showed the prevalence as 16%.[10] A study conducted on elderly Korean population found that female sex, age, and hormonal influence were risk factors for DED.[11] In Indonesia, prevalence is 27.5% in older age group especially those who are smokers. In Taiwan, its prevalence is 33.7% with women involved more,[13] while in India it is 29.25%.[14] Kanski describes the importance of humidity and temperature which is responsible for the integrity of the tear film.[15]

The goal of this study was to know the pattern of DED and its associated risk factors like smoking and medications in elderly people of Islamabad. Some known risk factors of DED such as diabetes, arthritis, thyroid disease, hyperlipidemia, and multivitamins were not investigated in this study.

Patients and Methods

This cross-sectional study was conducted in Department of Ophthalmology, Federal Government Services Hospital Islamabad from 1st Jan 20l2 to 31st Dec 2012. Only those patients who consented for the study were included in the study. Mentally handicapped patients, patients with corneal and conjunctival problems, patients with contact lens, intraocular surgeries during six months and any ocular surface disease were not included.

Written permission was taken from ethical committee. A trained interviewer filled 5 items Dry Eye Questionnaire (DEQ5). After that, the score was calculated. All participants had a general physical and a thorough ophthalmologic examination. Tear film breakup time (TBUT] and Schirmer's test were performed each at 10-minute intervals. Corneal fluorescein staining, punctate epithelial erosions, conjunctival injection, papillary hypertrophy, follicles and examination of lids for plugging and mucous strands were considered as indicators of dry eye. Patients already using tear substitutes, medications were stopped for an overnight. The diagnosis was made on the presence of three out of five parameters, dry eye questionnaire scores >6, TFBUT ≤10 seconds, Schirmer's test ≤5 mm in 5 minutes and at least two of the dry eye signs. The presence of pterygium was also recorded. SPSS 17 was used to analyzed the data.

Results

In this study, the percentage of male patients were slightly higher than females. Among 1600 patients, 52.6% (843/1600) were male and 47.4% (757/1600) were female. Sixty two percent (992/1600) belonged to urban while 38% (608/1600) from rural areas. Dry eye was present in 30.3% (486/1600), among these, 261(53.7%) were males and 225(46.25%) were females (Table 1). A maximum number of patients in this study was more than 50 years old. Sixty percent (133/225) of females were post-menopausal.

Table 1. Gender wise frequency in study population

	Male n(%)	Female n(%)
Total (n=1600)	843 (52.6%)	757 (47.4%)
DED(n=486)	261 (53.7%)	225 (46.3%)

About 29% (140/486) patients were on antihistamines. 21% (102/486) were on an antidepressant. 17% (82/486) patients were on medication for benign prostatic hypertrophy and 36.4% (177/486) of the dry eye cases were smokers (Table 2).

Table 2: Risk factors associated with DED

Risk factor	n (%)
Antihistamine	140 (29%)
Antidepressants	102(21%)
Medication for BPH	82 (17%)
Smokers	177 (36.4%)

Most common symptoms in our study were watering 31.6%, gritty/irritation 22.8% and redness 19.9%. Among symptomatic patients, 81.4% (396/486) had a low TFBUT (≤ 10 seconds), 60.6% (295/486) had a low Schirmer test result (≤5 mm), 36% (174/486) had fluorescein scoring 1 or greater, and 58.8% (286/486) had abnormal anatomic features of the meibomian glands. Among symptomatic patients, 57.6%(280/486) had visited an eye clinic, 27%(131/486) had been diagnosed as a patient of DED and 15.4%(74/486) already been using eyedrops. Blepharitis was detected in 51.4% (250/486) of the dry

eye cases. In our study 27% (131/486) subjects were having uncorrected refractive errors.

Discussion

Our study in this population shows a higher prevalence of DED in males 53.7% (261/486) than females 46.2% (225/486) and in urban residents 59.2% (288/486) than 40.7%(198/486) rural subjects which is not consistent with other studies.[17] Islamabad, being the city of Government servants, male are more exposed to external environments like light/temperature and strong wind McCarty DJ while females are mostly housewives. Gupta et al (2000) suggested that long-term exposure to air pollution leads to DED.[14]

In our study, 30.3% 486 patients presented in eye unit were diagnosed as dry eyes. This is consistent with international Dews which states that global prevalence of DED is about 17% while in Asia it is higher about 30%.[16]

Other report showed that DED increased with age is consistent with our study. In our study, low TFBUT and Schirmer's values with advancing age were consistent with studies conducted by Shaumberg et al (2009)[18] and Moss et al (2008).[19] In the present study 60%(135/225) females had menopause, 40%(90/225) were otherwise normal. Blepharitis was present in 51.4% (250/486), 36.4% (177/486) of the DE cases were smokers.[20] Systemic medications Menopausal hormone therapy, which involves oestrogen and other hormones, has been shown to cause dry eye. Medications that reduce androgens, e.g. for prostate disease, also can cause dry eye.

Our study also supported the association between several medications and DED, 29% (140/486) patients were on antihistamines while 10% (48/486) were not. In a survey conducted by McCarty DJ on dry eye symptoms in Australian pilots, it was concluded that self-reported symptoms of dry eye were common in Australian pilots and were associated with aero plane class and flying time.[21] In our study, 17% (102/486) were in use of antidepressant and 10% (40/486) were not. Moss SE et al in their study of DED in elderly population and their associated risk factors, reported that some drugs (e.g., diuretics and antihistamines) are associated with a greater risk, whereas others (angiotensin-converting enzyme inhibitors) are associated with lower risk.[22] In another study on long-term incidence of dry eye in an older population by Moss SE et al, incidence was found greater ($p < 0.05$) in subjects with arthritis, allergy or thyroid disease not treated with hormone, using antihistamines, antianxiety medications, antidepressants, oral steroids or vitamins, and poorer self-rated health. However, incidence was less ($p < 0.05$) in subjects consuming alcohol. It was not significantly associated with blood pressure, hypertension, serum total or high density lipoprotein cholesterol, body mass, diabetes, gout, osteoporosis, cardiovascular disease, smoking, caffeine use, or taking calcium channel blockers or anticholesterol medications in their study. In a multivariable model with time-varying covariates, increased incidence was associated with age, female gender, poorer self-rated health, antidepressant or oral steroid use, and thyroid disease untreated with hormone. Again it was found lower in those using angiotensin-converting enzyme inhibitors or with a sedentary lifestyle.[23] In our study, 17% (82/486) patients were on anti benign prostatic hyperplasia (Anti-BPH) drugs showed a higher prevalence of DED. Other studies show a 1.7 to 1.9 increased risk of DED in patients using antidepressant medications.[24] In our study, 27% (131/486) subjects with uncorrected refractive errors had DED, which may be due to the habit of rubbing their eyes.

Strengths of our study is that we used a five items questionnaire to detect DE symptoms and it was a large population-based study. Moreover, trained interviewer reduces scoring bias.

Conclusion

There is a link between Dry Eye disease and our modern lifestyle. It is seen more commonly seen in patients taking anti-depressants, anti-BPH and antihistamine medicines. Dry eye is rarely sight-threatening. Apprehensive patients can be easily counselled and referred to tertiary care unit.

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